
INDIANA Epidemiology NEWSLETTER



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Pneumococcal Surveillance in Indiana

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Disease caused by *Streptococcus pneumoniae* results in widespread illness and death throughout the US each year. The bacterium, also called pneumococcus, is a common inhabitant of the respiratory tract and can be isolated in up to 70% of normal healthy adults. Rates of asymptomatic carriage vary with age, environment, and the presence of upper respiratory tract infections.

Population based studies have estimated that more than 60,000 cases and more than 6,000 deaths from invasive (isolates obtained from sterile fluid sites such as blood and spinal fluid) pneumococcal disease occur annually in the US. The overall incidence of invasive pneumococcal disease in the US is estimated to be approximately 21 cases per 100,000 population. The highest rates of pneumococcal disease occur in infants less than two years of age and also in the elderly. Pneumococcal disease rates for infants 12-23 months of age (~200 per 100,000) tend to be slightly higher than infants less than one year of age (~150 per 100,000).

The Indiana State Department of Health (ISDH) has conducted surveillance of invasive pneumococcal disease since June of 1998. One primary purpose for initiating pneumococcal surveillance was to monitor the rate of disease in infants less than five years of age in anticipation of the licensure of pneumococcal conjugate vaccine (PCV7). Beginning surveillance in 1998 allowed the ISDH to establish a baseline for tracking the decrease in disease rates following licensure of the new vaccine. The vaccine, known by the trade name Prevnar, was licensed in February of 2000. Initially, the surveillance conducted in Indiana was voluntary on the part of laboratories and then became mandatory for physicians, hospitals and laboratories in October of 2000.

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It is felt that Indiana data from 2000 and 2001 is comparable, and therefore this report focuses on those two years. In 2000, a total of 711 invasive pneumococcal cases were reported to the ISDH, of which 135 were under the age of five. In 2001, 633 cases were reported, with 103 being under the age of five. The remainder of this article will summarize the 2000 and 2001 surveillance data for pneumococcal disease in infants under the age of five. In addition, data from the pneumococcal isolate project being conducted by the ISDH Laboratory and the ISDH Epidemiology Resource Center will be reviewed.

Invasive Pneumococcal Disease in Children Less than Five Years of Age

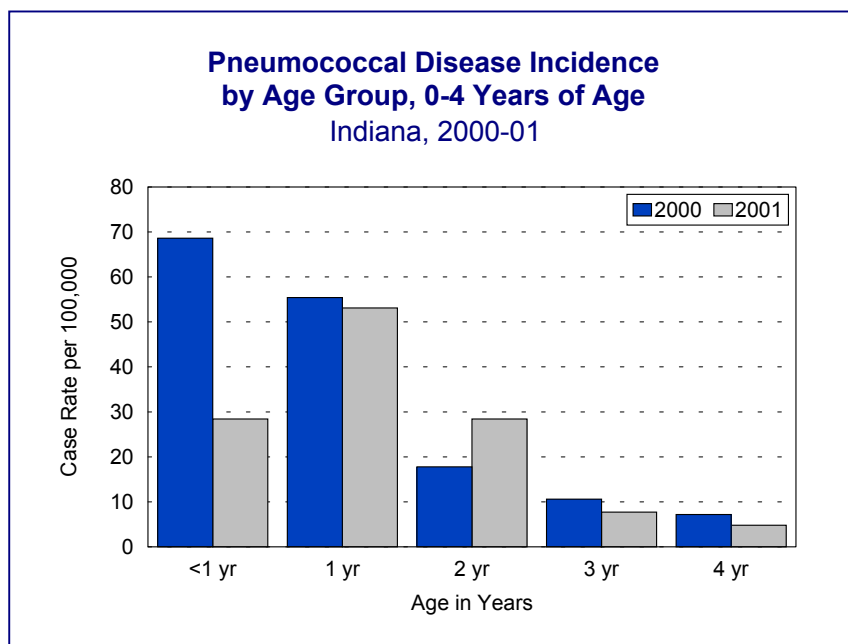
Table 1 shows the actual number of cases in infants, 0-4 years of age, in 2000 and 2001.

Table 1. Number of Invasive Pneumococcal Cases by Age Indiana 2000-2001

Age	2000	2001
<1 year	58	24
1 year	47	45
2 years	15	24
3 years	9	6
4 years	6	4
Total	135	103

The following graph depicts the invasive pneumococcal case rate per 100,000 population for 0-4 years of age.

Figure 1.



As can be seen above, the case rate for infants less than one year of age declined from 68.4/100,000 in 2000 to 28.4/100,000 in 2001, resulting in a significant drop in the case rate in just one year. Although this drop occurred only one year after the licensure of the PCV7, it is hoped this is the beginning of the same downward trend observed following the introduction of *Haemophilus influenzae* type b vaccine in the late 1980s. Children ages 1-4 showed very little change, which most likely reflects the fact that children who were already past the normal starting age of two months for the PCV7 series were not as likely to be vaccinated as a newly born infant. A decline in disease rate among the 1-4 year age group is likely to occur in future years.

During 2000 and 2001, isolates were obtained from four different body sites from children in this age group. There were a total of 238 unduplicated patients in this two-year period. Table 2 shows the frequency of sites from which the isolates were obtained. In 16 cases, an individual had pneumococcus isolated from two different sites. In all cases where isolates were obtained from two sites in the same patient, the two sites included blood and one other sterile site.

Table 2. Number of Isolates by Site of Infection in Children Under Five Years of Age; Indiana, 2000-2001

Site	Number (%) of Isolates		Number of Isolates from Second Site
Blood	213	(89.5%)	0
Spinal Fluid	22	(9.3%)	15
Pleural Fluid	1	(0.4%)	1
Tympanocentesis	2	(0.8%)	0
Totals	238		16

Of the 37 isolates from spinal fluid, 26 (70.3%) were found in infants less than one year of age, whereas only 34.5% (82/238) of all cases (0-4 years) were under one year of age. This data suggests that those less than one year of age are at greater risk to contract meningitis.

Death occurred in nine cases during the two year period, all of which were three years of age or younger. Six of the cases that resulted in death were less than one year of age, while two deaths occurred in a one-year-old child and in a three-year-old child.

The ISDH wishes to thank those local health department and infection control nurses, as well as the Immunization field staff, who have diligently collected the data for the pneumococcal surveillance system.

Pneumococcal Disease Isolate Project

As mentioned previously, PCV7 was first licensed in the US in February of 2000. PCV7 includes protection against seven pneumococcal serotypes (4, 9V, 14, 19F, 23F, 18C, and 6B), which account for 83% of meningitis cases and 86% of bacteremia cases in children less than six years of age, according to studies conducted from 1978-94.

Beginning in 2001, the ISDH Special Reference Bacteriology Laboratory began serotyping invasive *S. pneumoniae* isolates from children less than five years of age. In 2001 and so far in 2002, 30 isolates have been serotyped by the ISDH Laboratory.

Table 3 shows the serotypes identified by the ISDH Special Reference Bacteriology Laboratory. The table indicates that all vaccine serotypes have been identified in Indiana, with the exception of 9V, and that three serotypes (6B, 14, 19F) account for 72% (13/18) of all vaccine types.

Table 3. Serotypes Identified in Isolates Submitted to ISDH Laboratory

Vaccine Serotypes		Non Vaccine Serotypes	
Serotype	Number	Serotype	Number
4	1	6A	1
6B	5	9A	2
9V	0	15	1
14	4	19	1
18C	3	22	1
19F	4	22F	3
23F	1	33	1
		Other NVTs	2
Totals	18	Totals	12

Table 4. Age of Patients with Pneumococcal Isolates Submitted to ISDH Laboratory

Age	Number with Vaccine Serotype	Number with Non Vaccine Serotype
< 1 year	5	4
1 year	7	4
2 years	2	2
3 years	4	1
4 years	0	1
Totals	18	12

Of the 18 cases with isolates of vaccine serotype, only two of the cases had received any vaccine. One patient, a three-month-old infant, had received one dose of the four dose series, not enough to be considered protective. A second case, a three-year old child, had received one dose at 20 months of age, which would have been considered appropriately vaccinated. Therefore, one of the patients with a vaccine serotype could be considered fully immunized, while the other 17 infected with a vaccine serotype were not protected. These data, although limited, show that in general, children who have been infected with a vaccine serotype have not been vaccinated, and vaccine failures are occurring at a very low rate. Therefore, based on these very limited data, it appears that those being vaccinated are being protected against invasive disease.

The ISDH very much appreciates the cooperation of those laboratories that have submitted pneumococcal isolates for this project. We encourage laboratories to continue to send isolates obtained from sterile sites in children less than five years of age to the ISDH Special Reference Bacteriology Laboratory, 635 N. Barnhill Drive, PO Box 7203, Indianapolis, IN 46207-7203. **Laboratories, not currently submitting specimens meeting these criteria, are encouraged to join the project by submitting pneumococcal isolates to the ISDH Laboratory.** If laboratories have questions about this project they may contact Wayne Staggs, Epidemiologist, ISDH, at (317) 233-7112 or wstaggs@isdh.state.in.us.

The primary series of PCV7 vaccine beginning in infancy consists of three doses given at 2, 4, and 6 months of age. A fourth booster dose is recommended at 12-15 months of age. Unvaccinated children seven months and older do not require a full series of four doses. The number of doses needed for unvaccinated children seven months and older is based on age at which first dose is given (check the package insert for appropriate number of doses for these children).

As most immunization providers are aware there is currently a critical shortage of PCV7 vaccine. Providers should regularly check the CDC web site for current recommendations for use of pneumococcal conjugate vaccine during the shortage. The CDC "Current Vaccine Shortage" site may be accessed at www.cdc.gov/nip/news/shortages/default.htm.

Combating Childhood Obesity: Indiana's School Physical Activity and Nutrition Survey

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Introduction

The health of the nation is measured by leading health indicators, which reflect the major health concerns in the United States. These indicators are selected on the basis of their ability to motivate action, the availability of data to measure progress toward these indicators, and their importance as public health issues. The Healthy People 2010 objectives list 10 major concerns that have a profound effect on the quality and years of healthy life and on eliminating health disparities for individuals and the community as a whole. Tobacco use topped this list for many years, but has recently dropped to third position. Physical activity is now first and overweight/obesity is now in second position.

The Behavioral Risk Factor Surveillance Survey (BRFSS) shows that Indiana residents are among the most overweight and obese in the nation. Current legislation being proposed to the 107th Congress of the United States estimates the **annual** cost of obesity in this country is \$117 billion. Secretary of Health and Human Services, Tommy Thompson, estimates the annual cost of obesity in the United States, including lost productivity, as \$270 billion. Most attempts at reversing this trend target adults who are already obese. Estimates of annual expenditures by individuals who are attempting to lose weight are approximately \$44 billion.

Causes/Contributing Factors

Many factors contribute to the current obesity status of Americans and Indiana residents. Behavior patterns that lead to obesity start early in life and progress to lifelong habits. In simplest terms, overweight and obesity occur when more calories are consumed than are expended due to many factors. Lifestyles of adults and youth have changed dramatically in the last 25 years. High calorie, high fat foods are readily available and heavily advertised. Taste preferences have shifted to prefer these foods. At the same time, physical activity has decreased. The physical environment has evolved into a setting that discourages physical activity. Children do not always have the option of walking or bicycling to school and other events. Safety concerns prompt parents to order children to stay indoors after returning home from school instead of engaging in active leisure activity.

Daily physical education class is required in only one state, Illinois. In Indiana, there is a wide variation in frequency and intensity of physical education classes. The school lunch program faces many challenges in meeting the needs of the students and the school schedule. By the time children encounter the school lunch program, their food preferences are established and not likely to change even with education and promotion of healthier choices. Competitive, less nutritional choices are often available. Assessment of the actual food habits of Indiana youth was necessary before attempting interventions.

SPAN Survey

This past school year, the Indiana State Department of Health (ISDH) contracted with Indiana University Bloomington researchers, Alyce Fly and Mohammed Torabi, to conduct a survey to determine the nutrition and physical activity status of Indiana youth. The School Physical Activity and Nutrition Survey (SPAN) was developed by the University of Texas, funded by the Texas Department of Health. It surveys 4th, 8th and 11th grade students about food and beverage consumption, physical activity, and sedentary activity patterns.

The SPAN survey was conducted in 39 Indiana schools divided among four population densities: metropolitan, suburban, town and rural. The survey included 809 fourth grade students, 2,673 eighth grade students and 1,423 eleventh grade students. Participation in the survey was voluntary. If either parents or students objected for any reason, they were excused from the survey.

The fourth grade students took their 54-question survey as a group. Each question was read aloud and explained, if necessary. Several adults assisted students who needed help. This helped ensure accurate answers to all questions. The questionnaire used for both 8th and 11th grade students had 71 questions and was filled out independently. Teachers and researchers remained in the room to answer questions and maintain order.

Students were asked for an estimate of their height and weight. After the surveys were completed, they were weighed and measured for height for calculation of body mass index. Future analysis will compare those figures. The youngest students in the survey, 4th graders, already showed a tendency toward overweight and obesity. Thirty-six percent were in the "at risk for overweight" category (over 85th percentile) and 19-20% were in the "overweight" category (over 95th percentile).

Table 1. Body Mass Index (BMI) Distribution

	Average BMI	Over 85th Percentile	Over 95th Percentile
4th Grade Boys	19.6	36%	20%
4th Grade Girls	19.7	36%	19%
8th Grade Boys	23.4	40.3%	23.9%
8th Grade Girls	23.5	38%	19.2%
11th Grade Boys	25.0	36.1%	21.6%
11th Grade Girls	24.7	31.9%	14.7%

Physical activity is not required in most schools surveyed. Among the students who completed the 11th grade survey, 85% reported no physical activity class at school. This leaves them dependent on leisure time physical activity. Unless they are active in competitive sports, they are unlikely to get the recommended amount of physical activity. Lack of physical activity and increased sedentary activity become habits that are not easily broken.

Table 2. Physical Education

	Physical Education Class Last Week					
	5 Days	4 Days	3 Days	2 Days	1 Day	0 Days
4th Grade	1.0%	1.4%	0.9%	36.5%	41.1%	19.2%
8th Grade	44.1%	0.8%	15.7%	3.0%	1.1%	35.5%
11th Grade	7.9%	0.4%	5.9%	0.7%	0.2%	85%

Soft drinks and other sweetened beverages were linked to obesity in one study in schools of four communities in the Boston metropolitan area between October 1955 and May 1997. This study, reported in *The Lancet* (February 17, 2001), found that obesity increased by 60% with each additional serving of sugar-sweetened drinks. Availability of sugar-sweetened beverages has increased dramatically in recent years due to soft drink contracts for fund raising. Obesity is not the only threat from increased consumption of soft drinks. Sugar-sweetened beverages can replace milk as a beverage choice and put children and teens at risk for osteoporosis, which will not show up until much too late to prevent the condition. There is a very small window of opportunity to build bone mass that will last a lifetime. Once the teen years are past, bones increase very little in mass and, in fact, start to lose calcium. Close to half of all three grades reported drinking one or two soft drinks the day before the survey.

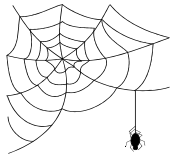
Barriers to Prevention and Treatment

Many factors influence health habits, some of which are not in the individual's control. Education alone has not proven effective in making significant changes. Some school lunch periods start as early as 10:30 a.m. and may be as short as 20 minutes. This makes it difficult for students to choose some of the healthful items that would take more time to eat. Early lunch periods can leave children hungry in the afternoon and promote snacking. A la carte items available at lunchtime and snack foods available in the afternoon are seldom the most nutritious choices.

Conclusion

Children learn more by observation of role models than from educational attempts. Parents must set the example for children in order to guide them into positive behavior patterns, including food and beverage consumption and physical activity.

In Indiana's youth, the trend toward obesity is moving rapidly. The known physical and financial consequences of obesity are serious enough to warrant action to halt this trend. Attempts at weight loss to correct the problem once an adult or child has become obese are expensive, frustrating and usually unsuccessful. Prevention is the logical action.



Wonderful Wide Web Sites

ISDH Data Reports Available

The ISDH Epidemiology Resource Center has the following data reports and the Indiana Epidemiology Newsletter available on the ISDH Web Page:

<http://www.statehealth.IN.gov> (under Data and Statistics)

Indiana Annual Report of Infectious Diseases
(formerly *Indiana Report of Diseases of Public Health*)
(1996, 97, 98, 99, 2000)

Indiana Cancer Incidence Report (1990, 95, 96)

Indiana Cancer Mortality Report
(1990-94, 1992-96)

Indiana Health Behavior Risk Factors
(1995-96, 97, 98, 99, 2000)

Indiana Marriage Report (1995, 97, 2000)

Indiana Maternal & Child Health Outcomes &
Performance Measures (1988-97, 1989-98, 1990-99)

Indiana Mortality Report (1999, 2000)

Indiana Natality Report (1995, 96, 97, 2000)

Indiana Induced Termination of Pregnancy Report
(2000)

Indiana Natality/Induced Termination of
Pregnancy/Marriage Report (1998, 1999)

HIV Disease Summary

Information as of May 31, 2002 (based on 2000 population of 6,080,485)

HIV - without AIDS to date:

394	New HIV cases from June 2001 thru May 2002	12-month incidence	6.48 cases/100,000
3604	Total HIV-positive, alive and without AIDS on May 31, 2002	Point prevalence	59.28 cases/100,000

AIDS cases to date:

394	New AIDS cases June 2001 thru May 2002	12-month incidence	6.48 cases/100,000
3038	Total AIDS cases, alive on May 31, 2002	Point prevalence	49.97 cases/100,000
6615	Total AIDS cases, cumulative (alive and dead)		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in May <i>MMWR</i> Week 18-21		Cumulative Cases Reported January - May <i>MMWR</i> Weeks 1-21	
	2001	2002	2001	2002
Campylobacteriosis	27	28	89	103
Chlamydia	1,277	1,386	6,554	6,763
<i>E. coli</i> O157:H7	9	5	21	13
Hepatitis A	7	2	37	21
Hepatitis B	6	0	12	9
Invasive Drug Resistant <i>S. pneumoniae</i> (DRSP)	23	28	109	100
Gonorrhea	496	534	2,690	2,921
Legionellosis	1	2	4	6
Lyme Disease	2	0	2	2
Measles	2	0	4	0
Meningococcal, invasive	9	3	15	18
Pertussis	8	3	19	18
Rocky Mountain Spotted Fever	0	0	0	0
Salmonellosis	44	39	133	134
Shigellosis	23	8	107	29
Syphilis (Primary and Secondary)	18	5	75	25
Tuberculosis	6	14	35	47
Animal Rabies	0	2	1 (Bat)	5 (4 Bats 1 Skunk)

For information on reporting of communicable diseases in Indiana, call the *ISDH* Communicable Disease Division at (317) 233-7665.

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Newsletter

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